

RIVERS AND FLOODS

By MONTROSE W. HAYES

[In charge River and Flood Division]

During April 1933 there were minor floods in the rivers of Michigan, and in some of the rivers draining into the Atlantic Ocean and the Gulf of Mexico. In addition, there were important floods in rivers in Iowa, in the Illinois, Wabash and Ohio Rivers, and in the rivers in the

lower Mississippi Basin. Some of the floods were continuations of the overflows of March, and others had not begun to recede at the end of April. Therefore, a discussion of the floods of both March and April will appear in a later issue of the REVIEW.

THE WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[By the Marine Division, W. F. McDonald in charge]

NORTH ATLANTIC OCEAN

By W. F. McDONALD

Atmospheric pressure.—Average pressure during April 1933 was, for the third month in succession, below normal over mid-latitude portions of the Atlantic. The deficiency in April was not large, exceeding a tenth of an inch only at Horta, but pressures were below normal from the Azores far southwestward over the Caribbean Sea and Gulf of Mexico.

In higher latitudes, the barometer averaged higher than normal. The excess at Belle Isle approached a quarter of an inch, and was above a tenth of an inch eastward to the British Isles and thence south to Gibraltar.

The extreme range of pressure shown at land stations (see table 1) was from 29.06 to 30.54 inches; both of these extremes were reported from the same station, Halifax. Pressure readings reported from ships on the North Atlantic revealed almost identical range, from the highest reading, 30.53, reported by the American S.S. *American Merchant*, at 42°30' N., 60°10' W., on the 15th, to lowest, 29.06, reported by the American S.S. *City of Baltimore*, at 44°50' N., 32°30' W., on the 20th.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, April 1933

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	In.	In.	In.		In.	
Julianehaab, Greenland.....	30.06		30.52	14	29.60	19
Reykjavik, Iceland.....	29.96	+0.16	30.50	19	29.15	2
Lerwick, Shetland Islands.....	29.94	+ .14	30.47	14	29.46	3
Valencia, Ireland.....	30.05	+ .16	30.45	14	29.47	25
Lisbon, Portugal.....	30.11	+ .12	30.34	26	29.79	30
Madeira.....	30.09	+ .08	30.52	1	29.79	29
Horta, Azores.....	30.01	— .14	30.33	1	29.63	23
Belle Isle, Newfoundland.....	30.06	+ .23	30.42	12	29.42	24
Halifax, Nova Scotia.....	30.02	+ .09	30.54	13	29.06	5
Nantucket.....	29.98	+ .01	30.43	20	29.27	4
Hatteras.....	29.96	— .05	30.29	13	29.52	25
Bermuda.....	29.99	— .10	30.32	1	29.46	26
Turks Island.....	29.98	— .04	30.10	1	29.92	11, 21, 22, 29
Key West.....	29.95	— .07	30.12	1	29.78	25
New Orleans.....	29.91	— .09	30.23	12	29.63	5
Cape Gracias, Nicaragua.....	29.89	— .08	29.94	1, 2, 12	29.82	23

NOTE.—All data based on a.m. observations only, with departures compiled from best available normals related to time of observations, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—April opened with a well-developed cyclonic area central not far east of Cape Race. With this center of low pressure there merged during the

next 10 days, a succession of cyclonic waves that passed into the Atlantic off the North American Continent. In the meantime, the original disturbance moved slowly northeastward toward Iceland.

These disturbances were not generally severe over a wide area, but were marked, especially during the first few days of the month, by squalls and thunderstorms of violent local character. Several vessels in the vicinity of Cape Hatteras on the 4th encountered and reported unusual line squalls, evidently connected with the frontal disturbance which destroyed the U.S. Navy dirigible *Akron* just off the coast of New Jersey, shortly after midnight of April 3-4.

Destruction of the *Akron* with 73 lives, was the only storm loss of serious proportions on the Atlantic during the month. The weather attending this disaster is of such great interest that charts VIII and IX, for April 3 and 4, 1933, are used to record the conditions on the morning preceding and following that event.

The low-pressure area shown on the New England coast in chart IX developed greater intensity as it moved on northeastward and caused fairly wide-spread gales on the 6th and 7th over the Atlantic west of the 35th meridian and southward in mid-ocean to the 35th parallel.

On the 14th a cyclonic development extending from the Azores to southern Greenland caused gales over the middle part of the main northern steamer routes. The period from the 7th to the 22d was otherwise relatively free from strong winds, although low pressure persisted steadily over the mid-Atlantic near the Azores.

The stormiest period of the month was the 3 days from the 23d to the 25th, when extensive cyclonic developments dominated the western and northern portions of the Atlantic. The highest wind recorded during the month was force 11, encountered by the American S.S. *American Farmer* near latitude 41° N., longitude 19° W., on the 24th.

High pressure conditions overspread the Atlantic after the 26th, and the last 4 days were practically free from winds of gale force.

Fog.—Fogginess increased greatly on the American coast from Cape Hatteras to the Grand Banks, where this condition was reported on 7 to 13 days. The highest frequency was between Cape Cod and Cape Hatteras. There were a few days with fog over mid-ocean, and a maximum of 5 days on the approaches to the English Channel.

OCEAN GALES AND STORMS, APRIL 1933

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN													
Livenza, Ital.S.S.	Gibraltar	New York	38 20 N	64 16 W	Apr. 1	Noon, 2	Apr. 2	29.76	WSW	SW, 8	SW	SW, 8	Steady.
Japan Arrow, Am.S.S.	New York	Sabine	33 10 N	75 45 W	Apr. 4	2 a., 4	Apr. 4	29.60	SW	SW, 7	NW	W, 8	SW-WSW.
Atlantic Sun, Am.S.S.	Houston	Marcus Hook	33 00 N	76 50 W	do	1 a., 4	do		SW	— 6	NW	— 10	SW-W-NW.
Europa, Ger.S.S.	New York	English Channel	42 03 N	61 40 W	Apr. 5	4 p., 5	Apr. 5	29.58	WSW	W, 8	NW	WSW, 9	
President Adams, Am.S.S.	Gibraltar	New York	42 14 N	32 32 W	Apr. 4	4 a., 5	do	29.51	W	NW, 6		NW, 8	
Black Tern, Am.S.S.	New York	Rotterdam	41 08 N	48 27 W	do	Mdt., 6	Apr. 7	29.36	WSW	N, 6	NNW	W, 9	NW-N.
Maasdam, Du.S.S.	Antwerp	Habana	33 49 N	48 03 W	Apr. 6	4 a., 7	do	29.62	W	W, 9	WNW	WNW, 9	W-WNW.
Exmouth, Am.S.S.	Casablanca	Norfolk	35 31 N	39 10 W	Apr. 7	2 p., 7	do	29.50	S	SW, 7	W	WSW, 8	
Scapenn, Am.S.S.	Copenhagen	New York	58 33 N	9 00 W	Apr. 12	2 a., 12	Apr. 12	29.79	W	W, 7	NW	WNW, 8	W-NW.
Penrith Castle, Br.S.S.	Gibraltar	do	37 52 N	40 25 W	do	4 p., 13	Apr. 15	29.90	S	W, 6	NW	NW, 8	Steady.
Silverwainut, Br.M.S.	Port Said	Boston	40 10 N	38 20 W	Apr. 13	2 p., 14	do	29.59	SW	WNW, 8	N	NNW, 9	WSW-WNW.
Youngtown, Am.S.S.	Rotterdam	Tampico	23 00 N	94 40 W	Apr. 15	—, 15	do	29.99	NNW	NNW, 7	NNW	N, 8	
Capetown Maru, Jap.S.S.	Hamburg	New York	45 28 N	35 20 W	Apr. 16	10 a., 16	Apr. 17	29.25	W	NW, 9	NW	NW, 9	
W. S. Miller, Am.S.S.	Houston	Fall River	39 34 N	71 57 W	Apr. 19	10 a., 19	Apr. 24	30.06	NE	NE, —	NE	NE, 8	Steady.
West Imboden, Am.S.S.	Pernambuco	Boston	35 27 N	62 21 W	Apr. 17	4 p., 20	Apr. 21	29.93	NE	NE, 8	NE	NE, 8	Do.
Coamo, Am.S.S.	New York	San Juan and return	34 20 N	71 30 W	Apr. 23	2 a., 23	Apr. 23	29.67	N	N, 8	N	NE, 8	N-NE-N.
West Madaket, Am.S.S.	Avonmouth	Panama City, Fla.	44 00 N	23 15 W	do	10 p., 23	Apr. 24	29.20	SSW	SW, 8	NW	NW, 10	SSW-NW.
Binnendyk, Du.S.S.	Habana	Antwerp	37 35 N	52 38 W	do	4 a., 24	do	29.40	SSE	S, 8	NNW	S, 8	SSE-S-NW.
Black Gull, Am.S.S.	New York	do	44 50 N	42 26 W	Apr. 24	6 p., 24	do	29.50	S	S, 8	NW	NW, 9	
American Farmer, Am.S.S.	London	New York	41 03 N	18 45 W	Apr. 23	10 a., 24	Apr. 25	28.95	SSW	W, 10	WSW	W, 11	
Tuscarora, Br.S.S.	do	Philadelphia	49 32 N	15 54 W	Apr. 22	10 —, 24	Apr. 26	29.17	SW	S, 9	WNW	SW, 10	S-SW-W.
Mexican, Am.S.S.	Wilmingon, Calif.	New York	35 30 N	73 32 W	Apr. 25	do	Apr. 25	29.47	SSW	SSW	SSW	SSW, 10	Steady.
Black Tern, Am.S.S.	Antwerp	Baltimore	49 44 N	14 20 W	do	8 a., 25	Apr. 27	29.48	SSE	WSW, 7	N	W, 9	SSE-SW-W.
McKeesport, Am.S.S.	Havre	New York	41 18 N	64 30 W	Apr. 26	9 a., 26	Apr. 26	29.44	S	S, 9	SW	S, 9	S-SSW.
Black Falcon, Am.S.S.	New York	Rotterdam	49 11 N	21 55 W	Apr. 28	8 p., 30	Apr. 30	29.89	N	NNE, 7	NNE	NNE, 9	N-NNE.
NORTH PACIFIC OCEAN													
Yeiyo Maru, Jap.S.S.	Yokohama	Los Angeles	42 30 N	166 10 E	Mar. 31	8 p., 1	Apr. 3	29.04	SW	S, 5	W	W, 8	S-W.
Hauraki, Br.M.S.	Suva, Fiji	Vancouver	48 20 N	125 05 W	Apr. 2	8 p., 3	do	30.13	WNW	NW, 7	NW	NW, 8	WNW-NW.
City of Victoria, Br.S.S.	Muroran	do	47 40 N	160 59 E	do	8 a., 2	do	28.87	W	W, 7	NW	NW, 8	Steady.
Batou, Du.S.S.	Los Angeles	Portland	40 53 N	124 51 W	Apr. 3	—, 4	Apr. 4	29.88	NNW	NNW, 11	N	NNW, 11	N-NNW-N.
Admiral Peoples, Am.S.S.	Portland	San Diego	44 49 N	124 18 W	Apr. 5	4 p., 5	Apr. 7	29.79	N	NNW, —	N	NNW, 8	Steady.
Silverbelle, Br.M.S.	Manila	Portland	49 57 N	164 45 W	Apr. 8	—, 9	Apr. 10	29.45	NNW	W, 8	NW	W, 8	Do.
City of Victoria, Br.S.S.	Muroran	Vancouver	49 02 N	144 00 W	Apr. 12	8 a., 12	Apr. 13	29.41	SSW	SSW, 7	SW	SSW, 8	Do.
New York, Am.S.S.	Otaru	San Francisco	42 17 N	146 50 E	Apr. 15	5 a., 16	Apr. 16	29.12	S	S	S	S, 8	SSW-SW.
Levant Arrow, Am.S.S.	Dairen	San Pedro	39 35 N	153 45 E	do	10 a., 16	Apr. 17	29.47	SE	S, 9	W	S, 9	SSE-S-W.
New York, Am.S.S.	Otaru	San Francisco	49 39 N	163 30 W	Apr. 23	7 a., 24	Apr. 25	29.02	ESE			S, 9	Steady.
Kiyo Maru, Jap.S.S.	Yokohama	Los Angeles	41 36 N	164 21 E	do	2 p., 23	do	29.09	NE	NE, 8	NW	NE, 8	E-NE-N.
Bonneville, Nor.M.S.	Bais, P.I.	San Pedro	39 29 N	170 28 E	do	10 a., 24	do	29.42	SSE	SW, 11	WNW	WSW, 11	SW-WSW.
Olympia, Am.S.S.	Taku Bar	Vancouver	49 35 N	163 35 W	Apr. 27	do	Apr. 28	29.58	S	S	SSW	S, 10	Steady.
Stanley Dollar, Am.S.S.	Guam	Los Angeles	40 20 N	173 30 E	Apr. 28	10 a., 28	do	29.49	WSW	WSW, —	WSW	WSW, 9	Do.
Ethan Allen, Am.S.S.	Cebu, P.I.	San Pedro	32 00 N	155 00 E	do	3 a., 29	Apr. 29	29.78	NE	ENE, 9	NE	ENE, 9	E-ENE-NE.
Bonneville, Nor.M.S.	Bais	do	40 35 N	144 50 W	Apr. 29	1 a., 30	May 1	29.84	SW	WSW, 7	NW	WNW, 9	WSW-W.
SOUTH PACIFIC OCEAN													
Elveric, Br.S.S.	Tyne	Melbourne	41 04 S	129 50 E	Apr. 7	2 p., 10	Apr. 13	29.38	NNE	NW, 4	SW	NNW, 10	
Monterey, Am.S.S.	Pago Pago	San Pedro	31 00 S	175 49 E	Apr. 11	4 p., 12	do	29.34	ESE	ESE, 9	NW	ESE, 9	E-ESE-NE.

¹ Barometer uncorrected.

NORTH PACIFIC OCEAN, APRIL 1933

By WILLIS E. HURD

Atmospheric pressure.—During April 1933 the greater part of the centers of cyclonic action on the North Pacific except in the northwestern sector, ran in higher latitudes than normal, and as a consequence the average center of the Aleutian low lay over the Bering Sea (St. Paul, 29.67 inches), where the pressure was a tenth of an inch below the normal.

Anticyclonic conditions were well established over most of the middle-latitude region and the extreme northeast, with pressures above normal from lower Alaska and the northern west coast of the United States southwestward to Midway Island and thence westward to the China coast. Depressions were few or entirely absent over much of the eastern half of this great area during the month.

Cyclones and gales.—A sharp diminution in gale occurrence was experienced in April as compared with March on the North Pacific. Even in the neighborhood of the Kuril Islands and northern Japan—frequently the stormiest region of the ocean—gales were infrequent, with none reported as exceeding force 9.

Cyclonic activity was for the most part comparatively weak over the main ocean routes, except during the periods of considerably depressed barometer which occurred over the Aleutian area on a few early and late days of the month. The second of these periods caused the most wide-spread storminess of April, during the 23d to 28th. The area swept spottedly by gales at this time lay roughly between latitude 39° N. and the Aleutian Islands and longitudes 160° W. and 170° E. Few observations, however, showed winds exceeding 9 in force, and of these the severest was a southwesterly gale of force 11 near the one hundred and eightieth meridian and 40° N. on the 24th.